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(54) Title: METHOD AND DEVICE FOR PROVIDING A SLEEVE ROUND A CONTAINER			
(57) Abstract			
<p>A method and a device for providing a sleeve (11) round a container, in particular a bottle (2), wherein the sleeve is held by one edge by gripping means. Then the sleeve is pulled over the container to a predetermined position by the gripping means, and placed tightly round the container in that position. The container is moved along while the sleeve is being provided, and the gripping means make a movement which is the result of a motion component corresponding with the movement of the container and a downwardly directed motion component. The gripping means are thereby capable of making a rectilinear movement parallel to the vertical plane through the conveyor belt (1), which movement in downward direction includes an acute angle with the direction of movement of the containers. The velocity of the conveyor belt remains constant when the number of containers to be handled per time unit is being adjusted, whilst control means change the spacing between the moving containers.</p>			

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METHOD AND DEVICE FOR PROVIDING A SLEEVE ROUND A CONTAINER

5 The invention relates to a method for providing a sleeve round a container, in particular a bottle, wherein the sleeve is held by one edge by gripping means and is subsequently pulled over said container to a predetermined position by said gripping means, and placed tightly round
10 said container in that position. Said placing of the sleeve tightly round the container may take place by using a stretch foil, whereby the diameter of the sleeve is reduced by extending the sleeve in axial direction. Furthermore shrink foil may be used, whereby the sleeve will shrink
15 round the container as a result of being heated.

The sleeve round the container may not only function as a label or for carrying certain information, it may also function to stiffen the container. The term bottle used
20 herein is understood to include also other types of containers.

When bottles are to be provided with a sleeve it is usual to feed such bottles to the device that provides the sleeve
25 by means of a conveyor belt. In said device the bottle is positioned at the predetermined place, after which a gripping means, which holds one edge of the sleeve, pulls the sleeve over the bottle. After the sleeve has been provided, the bottle is carried off, also by means of a conveyor belt, for example. During the period of standstill
30 of the bottle the gripping means move down over the bottle and subsequently up again. This makes it necessary for the bottle to remain in a stationary position for a considerable length of time, which slows down the passing of the bottles.
35 In addition to that it also takes a considerable length of time to stop the bottle and set it going again, especially when the bottle is already filled with a liquid, and it is not simple to position a bottle at exactly the same place

every time. Especially with filled bottles there is a danger that the bottle will fall when a bottle in upright position is accelerated or decelerated too quickly.

- 5 The object of the invention is to provide a method wherein containers can be provided with a sleeve in a quick, efficient and reliable manner.

In order to accomplish that objective the container is
10 according to the invention moved along while the sleeve is being provided, at least with respect to the machine that provides said sleeve, and the gripping means make a movement which is the resultant of a motion component corresponding with the movement of the container and a downwardly directed
15 motion component. This makes it possible to provide a bottle with a sleeve while being moved, so that delaying the bottle will not be necessary.

According to another aspect of the invention the container
20 is moved along on a conveyor belt, and the gripping means make a rectilinear movement parallel to the vertical plane through said conveyor belt, which movement in downward direction includes an acute angle with the direction of movement of the containers. The velocity at which the
25 gripping means make a rectilinear movement can be precisely adjusted thereby, in dependence on the velocity of movement of the container, so that the gripping means make an exactly vertical movement relative to the container.

- 30 In one preferred embodiment the velocity of movement of the containers is kept constant at all times, whilst the number of containers to be handled per time unit is adjusted in that the spacing between the moving containers is changed by control means. As a result of this also the velocity at
35 which the gripping means are moved will remain constant, which contributes to a satisfactory operation of the gripping means.

According to another aspect of the invention the bottles are detected by detection means upon approaching the gripping means, whereby the detection means initiate the downward movement of the gripping means when a bottle 5 passes. The positioning of a bottle in the transverse direction of a conveyor belt may take place in a simple manner, for example by means of a guide rail, whilst the positioning of a bottle in the longitudinal direction of the conveyor belt is not relevant for a correct provision 10 of the sleeve, because the bottle itself causes the signal that triggers the gripping means. In this manner it is achieved that positioning of the container with respect to the gripping means is possible.

15 In order to adjust the amount of containers to be handled per time unit, a positioning element comprising circumferential recesses, in which containers being moved along may be present, can according to another aspect of the invention be rotated in such a manner that one container 20 at a time will be released, with the spacing between the containers being adapted to the amount of containers to be handled per time unit. The conveyor belt may thereby be set to maximum velocity at all times, independently of the number of containers to be handled per time unit.

25 According to another aspect of the invention the positioning element is capable of rotating at a varying rotational speed, such that the rotational speed is increased each time before the container is released. As a result of this the 30 transfer from the positioning element to the conveyor belt can take place smoothly, which is conducive towards a satisfactory positioning of the containers.

The invention furthermore relates to a device for providing 35 a sleeve round a container, in particular a bottle, comprising gripping means for holding one edge of said sleeve and moving means for moving the gripping means in

downward direction in order to pull the sleeve over the container, which device is according to the invention characterized by conveying means for moving the containers along while the sleeve is being provided and by moving means which move the gripping means obliquely to the direction of transport of the conveying means.

Preferably the device is designed to enable adjusting the amount of travel of the gripping means, for example when a different type of container is to be provided with a sleeve. In addition to that it is possible to change the angle of downward movement of the moving means when a different constant velocity of the conveying means is set.

Preferably the gripping means are secured to a substantially U-shaped member, which member extends substantially in a horizontal plane, whereby the open side of said U points in the downstream direction of the conveying means. As a result of this the container can move through the open side of said U after the sleeve has been provided, whilst the gripping means move obliquely upwards.

Further aspects of the invention, which may be used both separately and in combination with each other, will be described hereafter by means of an embodiment and be defined in the claims.

In order to explain the invention more fully an embodiments of a device for providing a sleeve round a container will be described with reference to the drawing.

Figure 1 is a front view of the device; and
Figure 2 is a plan view of the device.

The Figures are merely diagrammatic representations of an embodiment.

The embodiment comprises a conveyor belt 1, on which bottles are placed. The conveyor belt moves to the right (Figure 1) and in the direction indicated by arrow 3 (Figure 2).

5 Conveyor belt 1 has a constant velocity, which is selected such that the maximum amount of bottles per time unit can be provided with a sleeve. In order to position bottles 2 in spaced-apart relationship on the conveyor belt, a rotatable positioning element 4 is provided, which rotates
10 about a vertical axis at such a speed that the desired spacing between the bottles is effected. To that end positioning element 4 is circumferentially provided with recesses 5, which may come into engagement with the bottles 2 that are present on conveyor belt 1. A guide rail 6
15 (Figure 2) is provided opposite positioning element 4 in order to ensure an accurate positioning of bottles 2 in the transverse direction of the belt.

20 In order to contribute further to a correct positioning of bottles 2 on conveyor belt 1, positioning element 4 rotates at a varying rotational speed, such that the rotational speed is increased before the container is released from one of the recesses 5, as a result of which the velocity
25 of the released container can be adapted to the velocity of the conveyor belt.

30 The device furthermore comprises a supply reel 7, on which a tubular plastic foil 8 is wound, which plastic foil 8 is unwound in order to separate pieces therefrom, which pieces form the sleeves. Said pieces may be cut off, or, if a
35 perforation is provided, be torn off.

Said separating of pieces from the plastic foil 8 may be carried out by one fixed clamping means 12 and two vertically movable clamping means 9. Said three clamping means are all provided with clamping elements (not shown). The two movable clamping means 9 can move conjointly in

vertical direction with respect to fixed clamping means 12, and are thereby capable of taking along plastic foil 8 each time they move downwards. The separating of the pieces of plastic foil takes place between the two clamping means 9, by means of a diagrammatically indicated cutting device 10. If the cutting device 10 is designed to move along with the clamping means 9, said cutting of the plastic foil 8 can take place during the downward movement.

- 10 In order to facilitate the unwinding of plastic foil 8, fixed clamping means 12 and movable clamping means 9 may each be provided with nozzles (not shown), which direct an air flow in such a manner that the plastic foil is positioned between the clamping elements of the clamping means. This facilitates not only the unwinding of the plastic foil 8 from supply reel 7, but it also makes it easier to pass foil 8 between the clamping elements, as for example takes place when a new supply reel 7 is put into use. The air flow moreover ensures that the cut edge of the plastic foil will remain correctly positioned, in spite of the vertical movement, for being passed between the clamping elements of the lower one of the two movable clamping means 9.
- 25 The sleeve 11 that has been separated from the plastic foil is engaged by gripping means, which are provided in a frame 15. The gripping means themselves are not shown in the drawing. Said frame 15 comprising the gripping means is capable of movement along a sloping, straight guide rail 30 13. The velocity at which the gripping means move along guide rail 13 is such that the gripping means make a rectilinear movement with respect to conveyor belt 1, which rectilinear movement is perpendicular to conveyor belt 1. This makes it possible for the gripping means to pull sleeve 35 11 over the bottle in a movement exactly parallel to the central axis of the bottle.

A detection means 14 in the form of a photocell is provided at the place where bottles 2 pass, at a speed of one per second, for example, after being released by positioning element 4, which detection means 14 detects the passage of 5 a bottle 2. At that moment the movement of gripping means is initiated, whereby the location of detection means 14 is such that the sleeve is accurately provided round the bottle.

10 After sleeve 11 has been provided round bottle 2, the gripping means move upwards again, whereby the movement of bottle 2, around which sleeve 2 has been provided, is not impeded because the gripping means are provided in frame 15, which is U-shaped, so that room is made on the open side 15 for the bottle 2 to pass (see Figure 2).

The control of the device takes place in control portion 16. Control portion 16 comprises a display screen 17 and a keyboard 18, for example for checking the operation and 20 for programming the device respectively.

The invention is not limited to the illustrated embodiment, which is only to be considered an example.

CLAIMS

1. A method for providing a sleeve round a container,
5 in particular a bottle, wherein the sleeve is held by one edge by gripping means and is subsequently pulled over said container to a predetermined position by said gripping means, and placed tightly round said container in that position, characterized in that the container is moved along
10 while the sleeve is being provided, and the gripping means make a movement which is the resultant of a motion component corresponding with the movement of the container and a downwardly directed motion component.
- 15 2. A method according to claim 1, characterized in that said container is moved along on a conveyor belt, and that said gripping means make a rectilinear movement parallel to the vertical plane through said conveyor belt, which movement in downward direction includes an acute angle with
20 the direction of movement of the containers.
- 25 3. A method according to any one of the preceding claims, characterized in that control means change the spacing between the moving containers when adjusting the number of containers to be handled per time unit, whilst the velocity of movement of the containers from said control means remains constant.
- 30 4. A method according to any one of the preceding claims, characterized in that stationary detection means detect the bottles which are approaching the gripping means, which detection means initiate the downward movement of the gripping means when a bottle passes.
- 35 5. A method according to any one of the preceding claims, characterized in that a positioning element which is rotatable about a vertical axis and which comprises

circumferential recesses, in which containers being moved along may be present, rotates in such a manner that one container at a time will be released, with the spacing between the containers being adapted to the amount of 5 containers to be handled per time unit.

6. A method according to claim 5, characterized in that said positioning element rotates at a varying rotational speed, such that the rotational speed is increased each time 10 before the container is released.

7. A device for providing a sleeve round a container, in particular a bottle, comprising gripping means for holding one edge of said sleeve and moving means for moving 15 the gripping means in downward direction in order to pull the sleeve over the container, characterized by conveying means for moving the containers along while the sleeve is being provided and by moving means which move the gripping means obliquely to the direction of transport of the 20 conveying means.

8. A device according to claim 7, characterized by a conveyor belt on which the containers may be placed and by a straight guide for moving the gripping means, which guide 25 extends parallel to a vertical plane through said conveyor belt, and which includes an acute angle with the direction of movement of said conveyor belt.

9. A device according to claim 7 or 8, characterized in 30 that detection means for detecting passing containers are present near said conveyor belt, upstream of said gripping means, which detection means are capable of initiating a downward movement of said gripping means.

35 10. A device according to any one of the claims 7 - 9, characterized in that the angle between the direction of movement of the gripping means and the direction of movement

of the conveying means is adjustable.

11. A device according to any one of the claims 7 - 10,

characterized in that the moving means for said gripping

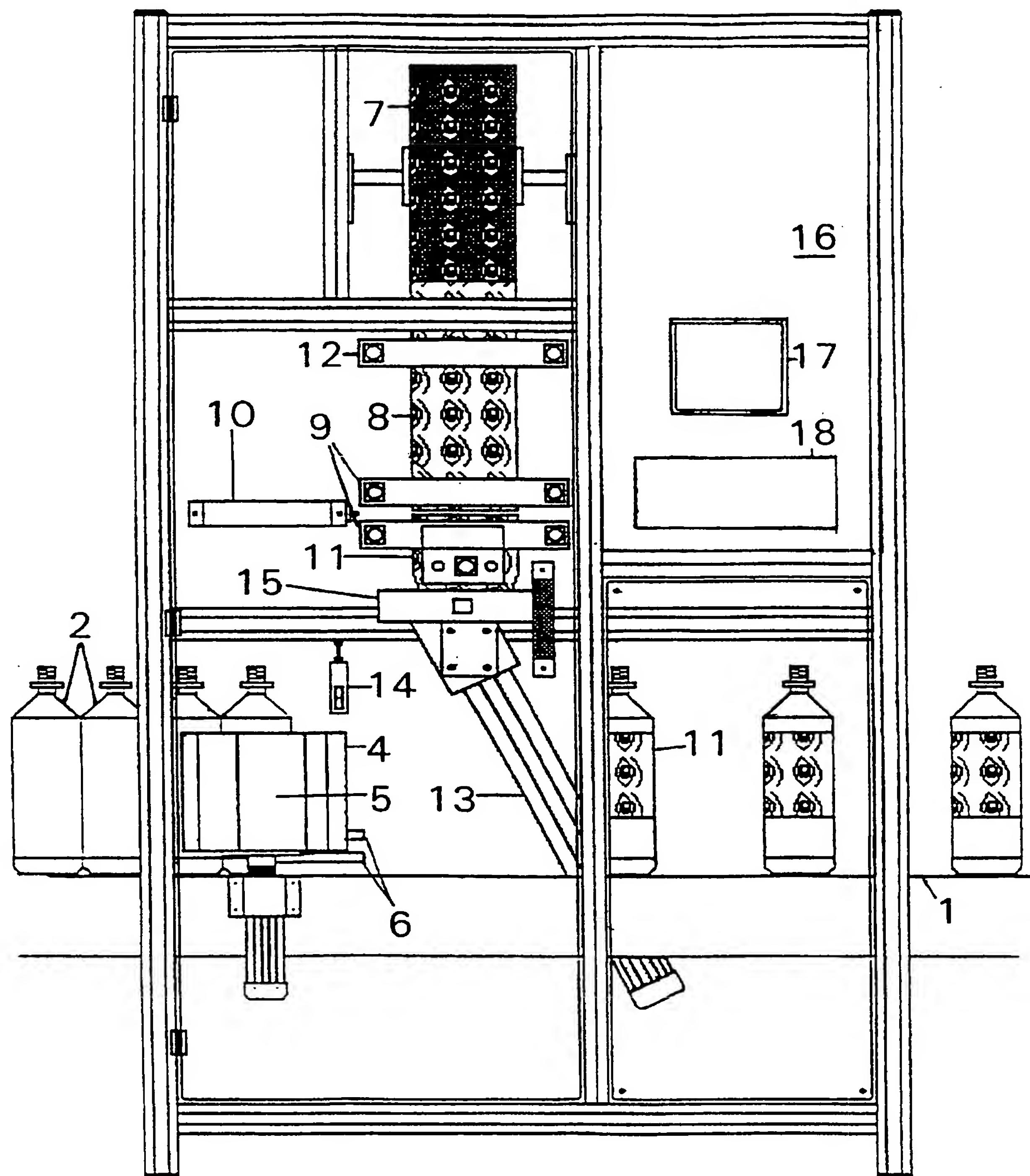
5 means comprise a straight guide, along which said gripping
means can be moved to and from by means of a toothed belt.

12. A device according to any one of the claims 7 - 11,

characterized in that said gripping means are secured to

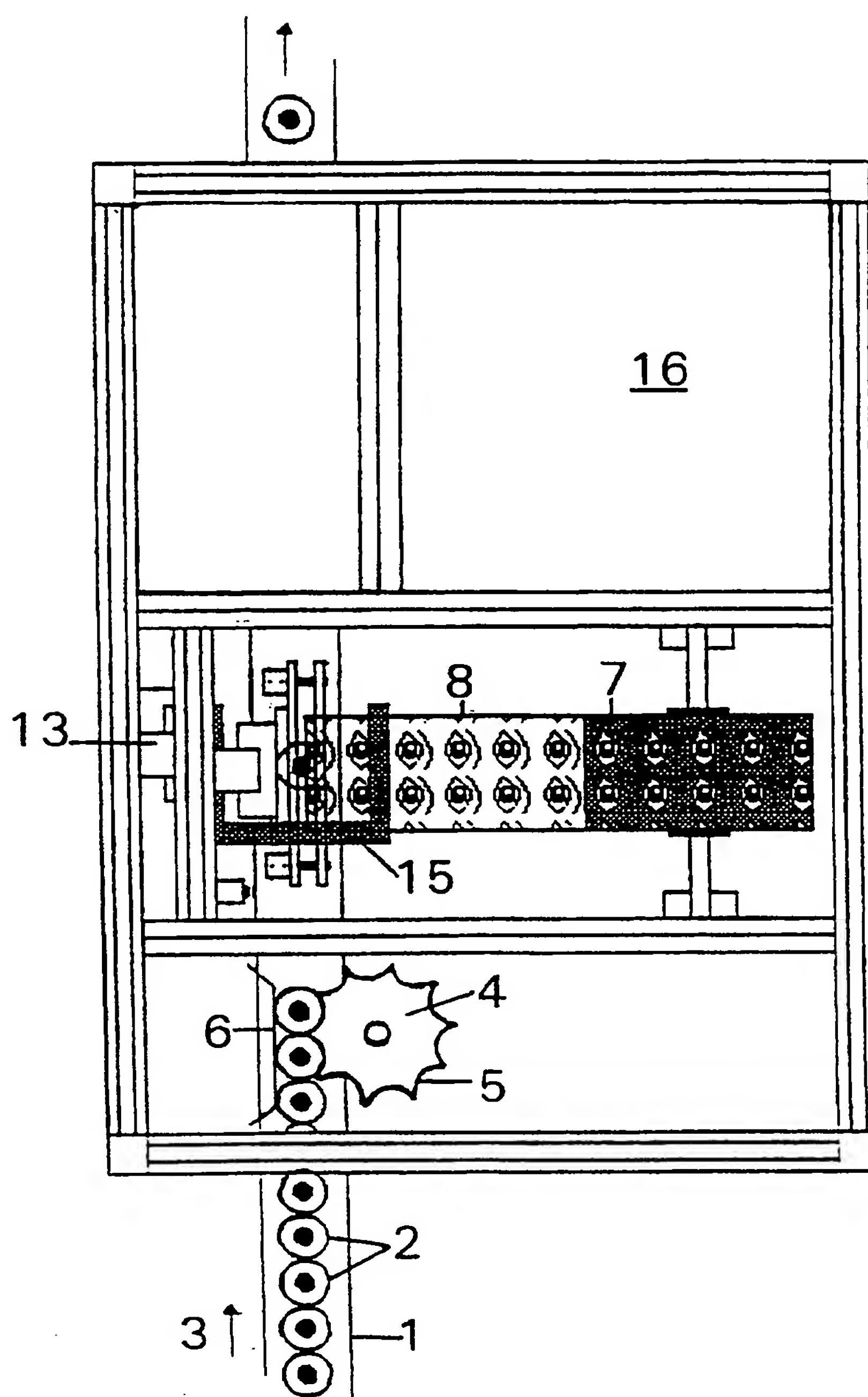
10 a substantially U-shaped member, which member extends
substantially in a horizontal plane, whereby the open side
of said U points in the downstream direction of the
conveying means.

1/2



Figuur 1

2/2



Figuur 2

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 97/00332

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B65B21/24 B65C3/06 B65B9/13

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B65B B65C B67B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 90 12 390 U (H. KRONSEDER) 20 December 1990 see page 4, line 1 - page 6, line 27; figures ---	1,2,5,7, 8
A	US 4 914 893 A (E. STRUB) 10 April 1990 see column 6, line 37 - column 15, line 55; figures ---	1,3-5,7, 9
A	EP 0 104 292 A (W. SCHEIDEGGER) 4 April 1984 see page 5, line 5 - page 8, line 18; figures ---	1,7

Further documents are listed in the continuation of box C.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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